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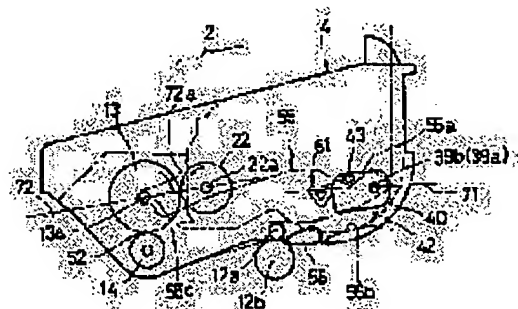
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(54) PROCESSING UNIT, PHOTORECEPTOR CARTRIDGE, DEVELOPING CARTRIDGE AND IMAGE FORMING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To automatically press a developing roller to a photoreceptor drum when a processing unit is set in the main body housing of an image forming device.

SOLUTION: A moving action part 43 projects from both right and left side walls outward from a frame type slide supporting member 40 turnably attached to the inner surfaces of both right and left side walls of a photoreceptor cartridge through rotary supporting shafts 39a and 39b. When a developing cartridge 4 is placed on the housing part of the photoreceptor cartridge, an inverted triangle part to which action is applied 61 projecting to the outer surfaces of both right and left sides of the developing cartridge 4 is placed adjacent to the member 40. By setting the pressing of the processing unit, the member 40 whose posture is changed by the sliding of the action part 43 tracing the upper and lower rugged parts of the upper guiding surface 55a of a guide means 55 provided on right and left sides of the main body housing presses the part 61 from the non-pressing state, so that the developing roller 22 is set to a state where it is pressed to the photoreceptor drum 13.



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CLAIMS

[Claim(s)]

[Claim 1] The process unit characterized by to have formed an energization means for energizing a developing roller to said photo conductor in a photo conductor cartridge, and to prepare the acted section on which said energization means acts in said development cartridge side while it had a photo conductor cartridge which has a photo conductor with which an electrostatic latent image is formed, and a development cartridge which has a developing roller for supplying a developer to a photo conductor and said development cartridge was constituted free [attachment and detachment] to a photo conductor cartridge.

[Claim 2] A process unit according to claim 1 characterized by being constituted so that a closest-approach location of a photo conductor and a developing roller may be located in an extension top of line of action of energization force of a developing roller over a photo conductor by said energization means, or the line-of-action bottom.

[Claim 3] A process unit according to claim 1 or 2 characterized by having a lock means for maintaining the condition of having equipped with said development cartridge to a photo conductor cartridge.

[Claim 4] Said lock means is a process unit according to claim 3 characterized by the acted section prepared in said development cartridge side, and being prepared in said photo conductor cartridge side, and locking lever objects in which posture modification is possible being alternatively consisted of by an operation location and non-acting location to said acted section.

[Claim 5] A photo conductor cartridge characterized by having an energization means for energizing a case of a photo conductor cartridge with a development cartridge removable while supporting a photo conductor with which an electrostatic latent image is formed, and its photo conductor which has a developing roller for supplying a developer to the photo conductor concerned, and a developing roller of said development cartridge with which said case was formed and equipped to a photo conductor.

[Claim 6] It is the photo conductor cartridge according to claim 5 which arranges an energization means of a left Uichi pair in an inside of right-and-left both sides of said photo conductor cartridge, and is characterized by being equipped with this each energization means in the energization direction and the non-energizing direction possible [posture modification] to the acted section prepared in said development cartridge.

[Claim 7] Said energization means is a photo conductor cartridge according to claim 6 characterized by being constituted to a rotation supporting-point member and this rotation supporting-point member by slide supporter material which can slide freely, and energization spring means constructed across among these both members.

[Claim 8] Said rotation supporting-point member is a photo conductor cartridge according to claim 7 characterized by equipping a right-and-left both-sides medial surface of a case in said photo conductor cartridge rotatable.

[Claim 9] A photo conductor cartridge according to claim 7 or 8 characterized by having had the migration operation section for guiding to said slide supporter material in the energization direction and the non-energizing direction in one, and having projected outward from right-and-left both sides of a case of said photo conductor cartridge.

[Claim 10] A photo conductor cartridge according to claim 5 to 9 characterized by equipping said case with a lock means for maintaining the condition of having equipped with said development cartridge.

[Claim 11] Said lock means is a photo conductor cartridge according to claim 10 characterized by having alternatively a locking lever object in which posture modification is possible in an operation location and a non-acting location to said acted section which was prepared in an at least 1 side inside of a case of said photo conductor cartridge, and was prepared in said development cartridge.

[Claim 12] A development cartridge characterized by having the acted section on which an energization means which was formed in a removable case and its case to a photo conductor cartridge which has said photo conductor, and was formed in said photo conductor cartridge in order to energize said developing roller to said photo conductor acts while supporting a developing roller and a developing roller for supplying a developer to a photo conductor.

[Claim 13] A development cartridge according to claim 12 characterized by having a processing laboratory which has a developing roller, and a developer hold room which stores a developer, and said acted section protruding on an outer wall of a developer hold room outward.

[Claim 14] A development cartridge according to claim 12 or 13 characterized by having the acted section to a lock means for maintaining the condition of having equipped a case of said development cartridge with the development cartridge concerned.

[Claim 15] A development cartridge according to claim 14 characterized by making the acted section to said lock means, and the acted section to an energization means make it serve a double purpose.

[Claim 16] Image formation equipment according to claim 1 to 15 characterized by having a guide means for constituting so that it may be equipped with a process unit free [attachment and detachment] to a main part of equipment, and showing said energization means to an energization condition and a condition of not energizing, along with migration to a path of insertion of a process unit to this main part of equipment.

[Claim 17] Image formation equipment according to claim 1 to 16 characterized by the migration operation section in said photo conductor cartridge having projected sideways possible [a slide contact] to said guide means.

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DETAILED DESCRIPTION**[Detailed Description of the Invention]**

[0001]

[The technical field to which invention belongs] This invention relates to the configuration of the image formation equipment of the electrostatic photograph type in a copying machine, facsimile or a laser beam printer, etc., the process unit used for it, a photo conductor cartridge, and a development cartridge.

[0002]

[Description of the Prior Art] There were some which use a process unit as a cartridge type and could be made to make exchange easy in order to make maintenance easy in the image formation equipment on which imprint conventionally the visible image which supplied and formed the developer in the electrostatic latent image formed on the photo conductor (photo conductor drum) to a record medium-ed, and the data of an alphabetic character or an image is made to record, for example, as indicated by JP,8-54786,A and JP,9-319285,A.

[0003] In this case, after equipping the main part (housing) of image formation equipment with the photo conductor cartridge equipped with the photo conductor at least, there were what was constituted so that the development cartridge equipped with the developer hold room and the developing roller could be detached and attached to said photo conductor cartridge, and a thing of a configuration of equipping housing of image formation equipment with the process unit which equipped with the development cartridge to the photo conductor cartridge beforehand.

[0004] By the way, at the time of image formation actuation, in a development field, in order to supply the thin layer of the developer formed on the surface of the developing roller to the electrostatic latent image of the surface of a photo conductor (photo conductor drum) and to form a visible image, it is necessary to set a developing roller so that the surface may be pressed on the surface of a photo conductor (photo conductor drum).

[0005]

[Problem(s) to be Solved by the Invention] However, exchange of the development cartridge by exchange of the photo conductor cartridge by deterioration of a photo conductor or consumption of a developer (toner) is faced. After making said developing roller and photo conductor estrange, since a developing roller is made to approach a photo conductor, again The surface of a developing roller carried out colliding on the surface of a photo conductor etc. at the time of said exchange, and there was a problem of not being it mutual components, or the location of the supporter of the development cartridge to a photo conductor cartridge deviation-coming to be easy, and the press of a developing roller to a photo conductor becoming impossible to homogeneity.

[0006] Moreover, if possible, the press of a development cartridge to a photo conductor cartridge and actuation of the discharge needed to be simplified, and handling needed to be made easy.

[0007] This invention aims at offering the image formation equipment which uses the process unit which could be made to make exact a press operation of the developing roller to a photo conductor, a photo conductor cartridge, a development cartridge, and them while it is made that these problems should be solved and makes exchange of a cartridge easy.

[0008]

[Means for Solving the Problem] In order to attain said purpose, a process unit of invention according to claim 1 It has a photo conductor cartridge which has a photo conductor with which an electrostatic latent image is formed, and a development cartridge which has a developing roller for supplying a developer to a photo conductor. While said development cartridge is constituted free [attachment and detachment] to a photo conductor cartridge, an energization means for energizing a developing roller to said photo conductor is formed in a photo conductor cartridge, and the acted section on which said energization means acts is prepared in said development cartridge side.

[0009] In a process unit according to claim 1, invention according to claim 2 is constituted so that a closest-approach

location of a photo conductor and a developing roller may be located in an extension top of line of action of energization force of a developing roller over a photo conductor by said energization means, or the line-of-action bottom.

[0010] Invention according to claim 3 is equipped with a lock means for maintaining the condition of having equipped with said development cartridge to a photo conductor cartridge in a process unit according to claim 1 or 2.

[0011] And in a process unit according to claim 3, said lock means is formed in the acted section prepared in said development cartridge side, and said photo conductor cartridge side, and invention according to claim 4 is alternatively constituted from a locking lever object in which posture modification is possible by an operation location and non-acting location to said acted section.

[0012] A photo conductor cartridge of invention according to claim 5 is equipped with an energization means for energizing a case of a photo conductor cartridge with a removable development cartridge which has a developing roller for supplying a developer to the photo conductor concerned, and a developing roller of said development cartridge with which said case was formed and equipped to a photo conductor while it supports a photo conductor with which an electrostatic latent image is formed, and its photo conductor.

[0013] Moreover, invention according to claim 6 arranges an energization means of a left Uichi pair in a photo conductor cartridge according to claim 5 to an inside of right-and-left both sides of said photo conductor cartridge, and it is equipped with this each energization means in the energization direction and the non-energizing direction possible [posture modification] to the acted section prepared in said development cartridge.

[0014] Furthermore, invention according to claim 7 is constituted for said energization means to a rotation supporting-point member and this rotation supporting-point member in a photo conductor cartridge according to claim 6 by slide supporter material which can slide freely, and energization spring means constructed across among these both members.

[0015] It is equipped rotatable [invention according to claim 8] to a right-and-left both-sides medial surface of a case [in / on a photo conductor cartridge according to claim 7 and / in said rotation supporting-point member / said photo conductor cartridge].

[0016] And in a photo conductor cartridge according to claim 7 or 8, it had the migration operation section for guiding to said slide supporter material in the energization direction and the non-energizing direction in one, and it has projected invention according to claim 9 outward from right-and-left both sides of a case of said photo conductor cartridge.

[0017] Invention according to claim 10 equips said case with a lock means for maintaining the condition of having equipped with said development cartridge in a photo conductor cartridge according to claim 5 to 9.

[0018] Invention according to claim 11 has alternatively a locking lever object in which posture modification is possible in an operation location and a non-acting location in a photo conductor cartridge according to claim 10 to said acted section which said lock means was formed in an at least 1 side inside of a case of said photo conductor cartridge, and was prepared in said development cartridge.

[0019] A development cartridge of invention according to claim 12 is prepared in a removable case and its case to a photo conductor cartridge which has said photo conductor, and in order to energize said developing roller to said photo conductor, it is equipped with the acted section on which an energization means formed in said photo conductor cartridge acts while it supports a developing roller and a developing roller for supplying a developer to a photo conductor.

[0020] Invention according to claim 13 is equipped with a processing laboratory which has a developing roller, and a developer hold room which stores a developer in a development cartridge according to claim 12, and said acted section protrudes on an outer wall of a developer hold room outward.

[0021] Moreover, invention according to claim 14 has the acted section to a lock means for maintaining the condition of having equipped with the development cartridge concerned in a case of said development cartridge in a development cartridge according to claim 12 or 13.

[0022] Furthermore, invention according to claim 15 makes the acted section to said lock means, and the acted section to an energization means make it serve a double purpose in a development cartridge according to claim 14.

[0023] In image formation equipment according to claim 1 to 15, invention according to claim 16 is constituted so that it may be equipped with a process unit free [attachment and detachment] to a main part of equipment, and it is equipped with a guide means for showing said energization means to an energization condition and a condition of not energizing along with migration to a path of insertion of a process unit to this main part of equipment.

[0024] Furthermore, in image formation equipment according to claim 1 to 16, the migration operation section in said photo conductor cartridge has projected invention according to claim 17 sideways possible [a slide contact] to said guide means.

[0025]

[Embodiment of the Invention] Next, this invention is explained below about the operation gestalt materialized to the laser beam-type printer. the condition that drawing 2 carries out wearing initiation of the process unit 2 to the main part housing 1 in drawing 1 is shown to the outline sectional side elevation of the printer as image formation equipment -- it is a notch side elevation a part.

[0026] As shown in drawing 1, in the main part housing 1 of a printer, the process unit 2 which becomes the abbreviation center section from the photo conductor cartridge 3 and the development cartridge 4 is arranged removable, the left-hand side in drawing 1 is adjoined at a process unit 2, a fixing assembly 5 is arranged, the feed section 6 is arranged under the process unit 2, and wearing of a sheet paper cassette 8 is enabled from the front face (arrow head A) in the lower part of the main part housing 1.

[0027] Moreover, the laser scanner unit 7 is attached in the inferior-surface-of-tongue side of covering object combination paper output tray 1a made of synthetic resin through the frame.

[0028] the cut form P as a record medium-ed by which the laminating was carried out on the support plate 9 of a sheet paper cassette 8, if print data are transmitted from the external device which is not a drawing example, for example, a personal computer, by printing command It is separated into one sheet at a time by the separation pad 11 along with rotation of the feed roller 10 of the feed section 6. Subsequently It is conveyed through resist roller pair 12a and 12b between the photo conductor drum 13 as a photo conductor in a process unit 2, and the imprint roller 14 as an imprint means to press to the inferior-surface-of-tongue side. The laser beam discharged from the injection hole of the inferior surface of tongue of the frame which, on the other hand, supports a laser beam light-emitting part, the polygon mirror 18, a lens 19, and the laser scanner 7 that consists of two or more reflecting mirror 20 grades is irradiated by the top peripheral surface of the photo conductor drum 13 from the light entrance 31 of the case 30, i.e., case of photo conductor cartridge 3, top in a process unit 2, the peripheral surface of the photo conductor drum 13 is exposed corresponding to print data, and an electrostatic latent image is formed.

[0029] Moreover, the developer (toner) supplied from the developing roller 22 in the development cartridge 4 adheres to said electrostatic latent image, and is visualized so that it may mention later. After the visible image by the developer on the photo conductor drum 13 (toner) is imprinted by Form P, it is fed between the heating roller 15 in a fixing assembly 5, and that of the pressure-welding roller 16, and the carrier beam form P is discharged on said covering object combination paper output tray 1a from the delivery path 17 in a heating fixing operation.

[0030] The process unit 2 consists of these operation gestalten so that it may separate according to an operation of the lock means 46 which it consists of a development cartridge 4 as a development means which has a developing roller 22 at least in the photo conductor cartridge 3 which has the photo conductor drum 13 at least, and the case 21 as a case, and the development cartridge 4 is constituted removable to the photo conductor cartridge 3, and a developing roller 22 mentions later and may become impossible.

[0031] Next, the configuration of the photo conductor cartridge 3 and the development cartridge 4 is explained to details. The photo conductor drum 13 is supported to revolve pivotable by the 1 side approach within the case 30 made of the synthetic resin, and the photo conductor cartridge 3 has closed with bottom wall 30a of a case 30 the lower part of the imprint roller 14 as an imprint means arranged under the photo conductor drum 13, as shown in drawing 3 - drawing 7 (refer to drawing 4). When it is supported to revolve possible [vertical movement] so that this imprint roller 14 may separate from photo conductor drum 13 inferior surface of tongue with a self-weight, and setting in the main part housing 1 as a process unit 2, The upward bearing 35 of U characters which the bearing push raising object 34 by which upward energization was carried out with the spring 33 arranged at the right-and-left both sides in the main part housing 1 inserted in the both ends of said shaft 14a is pushed up (refer to drawing 8 and drawing 9). It is arranged possible [rise and fall] so that the imprint roller 14 may press the inferior surface of tongue (imprint field) of the photo conductor drum 13.

[0032] In the upper part of the photo conductor drum 13 in the case 30 as a case of the photo conductor cartridge 3, the light entrance 31 which irradiates [wrap upper wall 30b] the laser beam from said laser scanner unit 7 at the upper surface side of the photo conductor drum 13 is formed in straight side in accordance with the shaft orientations of the photo conductor drum 13, the light entrance 31 is adjoined, and the electrification machines 36, such as scorotron for electrifying sensitization sides, such as an organic photo conductor of the photo conductor drum 13, are attached. An electrostatic latent image is formed by scanning said laser beam on the surface of the photo conductor drum 13 uniformly charged with said electrification vessel 36, and after the toner of the thin layer supplied with the developing roller 22 mentioned later adheres to an electrostatic latent image and is formed into a visible image (actualization), Form P imprints in a press imprint field with the imprint roller 14.

[0033] The portion except said upper wall 30b of said case 30 The upper part is opened wide, and a stowage 32 is formed so that the development cartridge 4 can detach and attach from the upper part. In the upper limit side of right-

and-left both-sides wall 30c of this case 30 It is installed so that the guide rail 37 of the shape of a downward circle for showing around supporting the bearing objects 23a and 23b (refer to drawing 13 thru/or drawing 15) with which the both ends of shaft 22a of a developing roller 22 were equipped pivotable relatively free [sliding] may approach shaft 13a of the photo conductor drum 13. If a deer is carried out and the development cartridge 4 is set to the photo conductor cartridge 3, a developing roller 22 can approach so that the photo conductor drum 13 may be countered (refer to drawing 4).

[0034] Moreover, the inside of said right-and-left both-sides wall 30c is equipped with the energization means 42 for pressing the developing roller 22 to the photo conductor drum 13 through the development cartridge 4 rotatable and possible [telescopic motion]. As shown in drawing 4 and drawing 10 , this energization means 42 is arranged within the limit of the rotation supporting-point member 39 to which the rotation pivots 39a and 39b protruded on right-and-left both sides in one, the slide supporter material 40 of the shape of a frame which supports this rotation supporting-point member 39 free [sliding] inside, and this slide supporter material 40, and is constituted by the energization spring means 41 of the shape of a coil spring energized so that the rotation supporting-point member 39 may be forced on one side. In addition, the migration operation section 43 of the shape of a sideways cylinder is formed in the slide supporter material 40, and this migration operation section 43 is arranged so that it may project outward from the guide hole 44 drilled in said right-and-left both-sides wall 30c.

[0035] And the lock means 46 for making it the development cartridge 4 in the photo conductor cartridge 3 inserted in in said stowage 32 inside side wall 30c (an example right-hand side side wall) not slip out upward is established. The rotation shaft 48 which penetrates side wall 30c as shown in drawing 4 , drawing 5 and drawing 11 (a), and drawing 11 (b) supports this lock means 46 pivotably rotatable to the side of the locking lever object 47, and the bottom approach part of the resin spring 49 prolonged downward from the lower limit of the locking lever object 47 is arranged so that 30d of regulation pieces which project upward from bottom wall 30a of a case 30 may be made to contact. Moreover, it has contact section 47a of the shape of a circle for contacting, if the upper surface [on the other hand / (right-hand side thing)] of the side view abbreviation inverse triangle-like acted section 61 which made the right-and-left both-sides side of the case 21 of the development cartridge 4 project outward moves to the inferior surface of tongue of the locking lever object 47 up so that it may mention later, and regulating the migration.

[0036] Said acted section 61 uses also [thing / for said lock means 46], and it is arranged so that it may be used also for the thing to the energization means for pushing a developing roller 22 against the photo conductor drum 13, and energizing it.

[0037] Moreover, the pivotable koro 50 which protruded on the stowage 32 in the photo conductor cartridge 3 upward from bottom wall 30a which is a case 30 and which is caught and is used as a member is formed in two or more places (an example two places of right-and-left both ends) (refer to drawing 3 and drawing 4). It catches, and when [this] the development cartridge 4 is made to drop and contain in a stowage 32, the koro 50 as a member sandwiches shaft 22a of a developing roller 22, and catches a part of weight of the development cartridge 4 in the photo conductor drum 13 and the opposite side. Specifically, the koro 50 lessens the backlash at the time of the attachment-and-detachment activity of a case 21 while responding to the inferior-surface-of-tongue part of the toner hold room 24 (refer to drawing 1 , drawing 12 (a), and drawing 12 (b)) of the letter of a downward convex curve prepared in the case 21 of the development cartridge 4.

[0038] Omission impossible is equipped with top roller 12a in said resist roller pair, it is adjoined and the oblong introductory hole 51 for introducing into the imprint section 52 between the photo conductor drum 13 and the imprint roller 14 the form P which passed resist roller pair 12a and 12b is formed in bottom wall 30a at bottom wall 30a of the case 30 in the photo conductor cartridge 3. This introductory hole 51 is adjoined, and it protrudes on the upper surface of bottom wall 30a of a before [said imprint section 52] so that the rib 53 of the a large number book for conveying contact resistance for the inferior surface of tongue of Form P smoothly in few condition may be prolonged in the direction of the imprint section 52 from the introductory hole 51. Next, the configuration of the development cartridge 4 is explained, referring to drawing 1 , drawing 12 (a), drawing 12 (b) - drawing 15 . After stirring with the agitator body 27 by which a rotation drive is carried out and being emitted, the toner in the toner hold room 24 of the letter of a downward convex curve in a case 21 is supported by the peripheral face of a developing roller 22 through a feed roller 25, and it is constituted so that the layer thickness of a toner may be regulated by the blade 26 (refer to drawing 1). And the abbreviation inverse triangle-like acted section 61 projects in right-and-left both the outsides of the part of said toner hold room 24 in a case 21 in one, and is formed in them.

[0039] The bearing objects 23a and 23b which consist of a material with small coefficient of friction, such as polyacetal resin inserted in pivotable to the right-and-left both ends of shaft 22a of said developing roller 22, are equipped with the engagement pawl 62 which escapes from an axis end, respectively and is inserted in a circular sulcus 63 at impossible.

The shaft diameter controller 64 of the shape of an umbrella to which a diameter becomes large gradually (the shape of a cone) is formed in the end face side of each bearing objects 23a and 23b, and sliding energization of the bearing object 23b [on the other hand / (an example right) / at least] is carried out outward [horizontal] by the spring means 65 (refer to drawing 15). Thereby, where the development cartridge 4 is set to the predetermined part of the photo conductor cartridge 3, shaft 22a of a developing roller 22 is supported to revolve without a backlash to the guide rail 37 prepared in the right-and-left both-sides walls 30c and 30c of the photo conductor cartridge 3.

[0040] In addition, as shown in drawing 1 , drawing 16 , and drawing 19 , the handle sections 70 and 66 for making the handling of carrying etc. easy, respectively are formed in the upper surface and the inferior surface of tongue of a case 21 of the development cartridge 4. Moreover, photo conductor cartridge 3 Two or more installation errand sections (the two minimum, preferably four places) 69 stabilized when the photo conductor cartridge 3 is laid in a table 67 are formed in the case 30 (refer to drawing 5 - drawing 7).

[0041] Next, the activity which sets the development cartridge 4 to the photo conductor cartridge 3 is explained. By wearing actuation which puts the development cartridge 4 into the stowage 32 of the upward disconnection by the side of the posterior part of the case 30 of the photo conductor cartridge 3 from a developing-roller 22 side If the acted section 61 contacts the locking lever object 47, the energization force of the resin spring 49 is resisted, the locking lever object 47 is rotated to the location of the two-dot chain line of drawing 4 and wearing is completed The acted section 61 falls caudad, contact on the acted section 61 and the locking lever object 47 concerned is canceled, it returns to the continuous line condition of drawing 4 according to the energization force of the resin spring 49, contact section 47a of the locking lever object 47 and the upper surface of the acted section 61 counter, and the locking lever object 47 will be in a lock condition.

[0042] While the bearing objects 23a and 23b of the right-and-left both-sides edge of a developing roller 22 **** to the guide rails 37 and 37 formed along with the upper limb of the right-and-left both-sides walls 30c and 30c of a case 30 at this time, it slides down so that shaft 13a of the photo conductor drum 13 may be approached. In this case, focusing on bearing object 23a to shaft 22a of a developing roller 22, and 23b place, since the case 21 of the development cartridge 4 is rotatable If the bearing objects 23a and 23b are located in the location (sideways [of U characters]-like section portion) which approached said shaft 13a mostly among guide rails 37 and 37 The toner hold room 24 side of the case 21 of the development cartridge 4 rotates focusing on shaft 22a of a developing roller 22, and it can set so that it may get into the stowage 32 in the photo conductor cartridge 3 entirely.

[0043] In this condition, the inferior surface of tongue of the case 21 by the side of said toner hold room 24 ****s to the koro 50 and 50 of the stowages 32, and the bearing objects 23a and 23b move along with guide rails 37 and 37 to the location as for which a developing roller 22 carries out a closest approach to the photo conductor drum 13 mostly. If the locking lever object 47 rotates to the location shown as a continuous line clockwise and returns to it from the two-dot chain line ***** location of drawing 4 , contact section 47a of the locking lever object 47 concerned counters the upper surface (height 61a) of the acted section 61, and now, the development cartridge 4 will escape from the photo conductor cartridge 3, and will serve as impossible.

[0044] Although drawing 16 - drawing 19 show the plan of the process unit 2 which is in the condition which set the development cartridge 4 to the photo conductor cartridge 3, right lateral drawing, left lateral drawing, and rear view (drawing of a form outlet side) Since facing down of the development cartridge 4 pushes in the slide supporter material 40 of the energization means 42 and it is pushed downward by ** in the acted section 61, as shown in drawing 2 and drawing 4 , the posture of the energization means 42 in which the migration operation section 43 turns down is usual.

[0045] And the process unit 2 is constituted so that it can detach and attach, where it made it rotate downward and lid 1b at the right end of the main part housing 1 in drawing 1 (front-face side) is opened greatly (refer to drawing 2).

[0046] As shown in drawing 2 , drawing 20 (a), drawing 20 (b), and drawing 21 , namely, to the inside of the right-and-left both-sides section of the main part housing 1 The guide means 55 (only right-hand side is shown by a diagram), such as a product made of resin of a left Uichi pair, are being fixed. For this guide means 55 Top slideway 55a which inclines upward as it is opened wide up and goes to a back side from the right end of the main part housing 1 and which was formed so that it might start and a downward inclination might be carried out after 55d of the top-most-vertices section from an inclined plane, It is arranged under this top slideway 55a, it inclines downward as it goes to a back side from the right end of the main part housing 1, and it has bottom slideway 55b which finishes with the part of bottom roller 12b of a resist roller pair.

[0047] Drawing 2 shows the location which carries out insertion initiation of the process unit 2 at the main part housing 1, and it pushes it in so that shaft 13a of the photo conductor drum 13 may approach back side 55c of a top slideway 55a top. Subsequently, as shown in drawing 20 (a), the migration operation section 43 in the energization means 42 contacts the standup inclined plane of said top slideway 55a. And the derivative 56 (only one of the two shows by a diagram)

which made it project sideways to the lower limit side of the right-and-left both sides of a process unit 2 (photo conductor cartridge 3) fits into bottom slideway 55b. Only by a upward omission is impossible for a process unit 2 and meeting bottom slideway 55b to the main part housing 1, it is pushed in, and it becomes possible.

[0048] Since the migration operation section 43 is pushed up by said top slideway 55a in this condition according to pushing migration of a process unit 2, the slide supporter material 40 carries out upward rotation a center [rotation pivot 39a (39 (b))], and the acted section 61 in the development cartridge 4 is restrained in the direction pushed in the tip side of the slide supporter material 40. And in the part whose migration operation section 43 is 55d of top-most-vertices sections of top slideway 55a, the slide supporter material 40 carries out the maximum facing-up rotation, and holds the condition of restraining said acted section 61 by the tip side of the slide supporter material 40 with this posture (refer to drawing 20 (b)).

[0049] Where it pushed in the process unit 2 further and shaft 13a of the photo conductor drum 13 is set to the predetermined location of back side 55c of a top slideway 55a top When an operator lifts a hand from a process unit 2, with the self-weight of the process unit 2 concerned It is laid on bottom roller 12b by which top roller 12a in the resist roller by the side of the inferior surface of tongue of the case 30 of the photo conductor cartridge 3 has been arranged at the main part housing 1 side. It settles down so that the development cartridge 4 side may descend to a derivative 56 being supported by the proper part of the guide means 55, at the same time it is pressed with the spring 45 shown in drawing 2 (refer to drawing 21).

[0050] In the condition of having set as mentioned above, said acted section 61 will be pushed by the tip side of said slide supporter material 40. Thereby, a developing roller 22 can be pressed to the photo conductor drum 13 through the development cartridge 4 by the energization means 42 and the acted section 61.

[0051] As shown in drawing 21 , and contact section (being closest-approach location press section) 72a (it is on ***** 72 which connects shaft 13a of the photo conductor drum 13 and shaft 22a of a developing roller 22) of the photo conductor drum 13 and a developing roller 22 Press line of action 71 (with rotation pivot 39a (39 (b))) to said acted section 61 of the energization means 42 It is desirable for it to be located above the line which connects the pressing point that the tip of the slide supporter material 40 is in contact with the acted section 61, or to be located on this line of action 71, and for this line of action 71 and said ***** 72 to carry out abbreviation coincidence, or to set up in parallel, so that closely.

[0052] In addition, the gear device 74 in which the power of a drive motor 73 is transmitted to the inside by the side of one of the main part housing 1 (an example left-hand side) is arranged, and the feed roller 10 of the feed section 6, resist roller pair bottom roller 12b, a developing roller 22 and the photo conductor drum 13 and a heating roller 15, and a list are made to carry out the rotation drive of the conveyance roller of a delivery path, respectively, as shown in drawing 22 . At this time, as drawing 1 and drawing 21 show a developing roller 22 and the photo conductor drum 13, an opposite direction 22, i.e., a developing roller, rotates counterclockwise mutually, and the photo conductor drum 13 is set up so that the peripheral velocity of a developing roller 22 may become quicker than that of the photo conductor drum 13, while driving so that it may rotate clockwise.

[0053] Therefore, as shown in drawing 23 , at the time of image formation actuation, the direction of the thrust F1 by said energization means 42 in contact section 72a is parallel to said press line of action 71, and the thrust F1 is decomposed into component-of-a-force F1V of the tangential direction of the circumference side of the photo conductor drum 13 and a developing roller 22, and component-of-a-force F1H of said ***** 72 direction.

[0054] From the difference in the peripheral velocity of said developing roller 22 and photo conductor drum 13, the frictional resistance force F2 which is the value which multiplied component-of-a-force F1H of press of the ***** 72 direction of the photo conductor drum 13 and a developing roller 22 by coefficient of friction acts upward downward to the photo conductor drum 13 in drawing 23 in contact section 72a to a developing roller 22. Therefore, the angular moment by said frictional resistance force F2 of acting on the development cartridge 4 acts on the circumference of developing-roller shaft 22a in the direction of a clockwise rotation in drawing 23 .

[0055] By the way, since a result which the angular moment of the direction of a counterclockwise rotation in drawing 23 acts on the development cartridge 4 focusing on developing-roller shaft 22a, and **** the angular moment by said frictional resistance force F2 is brought when said press line of action 71 passes along the upper part rather than developing-roller shaft 22a, the development cartridge 4 becomes relief feeling and is not desirable. The developing roller 22 at the time of image formation does not come floating, but it enables it to stabilize a press operation in this invention by the location of said developing-roller shaft 22a being located above the press line of action 71, or being on the press line of action 71, or setting up so that ***** 72 and the press line of action 71 may abbreviation be parallel and in agreement.

[0056] And since it is the press structure by the acted section 61 which formed the developing roller 22 in the

energization means 42 and the development cartridge 4 which carry out press energization to the photo conductor drum 13 and this acted section 61 was formed in the side far from the photo conductor drum 13 on both sides of the developing roller 22, the photo conductor drum 13, developing rollers 22, and these drives do not become a failure, but it becomes easy to set up the press line of action 71 and ***** 72 so that it may be a letter of parallel and may approach.

[0057] Moreover, if the development cartridge 4 is supported rotatable focusing on developing-roller shaft 22a of the developing roller 22 when the image formation activity is done in the condition of having equipped with the development cartridge 4 to the photo conductor cartridge 3 That is, bearing object 23a (23b) of the both ends of developing-roller shaft 22a of a developing roller 22 does not progress more than it by the back side of the guide rail 37 in the photo conductor cartridge 3, but the weight W_o of the development cartridge 4 sets to side view. The part of said bearing object 23a (23b), the part where the bottom side of the toner hold room 24 contacts the koro 50, If it sets up so that it may be distributed and supported by loads W_1 and W_2 by two places of the photo conductor drum 13 and the part of the opposite side on both sides of developing-roller shaft 22a (refer to drawing 23) The direction of the angular moment of the circumference of the axial center (shaft 22a) of the developing roller 22 by the frictional resistance force F_2 which a developing roller 22 receives from the photo conductor drum 13, Since the direction of the angular moment of the circumference of the axial center (shaft 22a) of the developing roller 22 by the self-weight (load W_o of a center of gravity G) of the development cartridge 4 turns into the same direction (it sets to drawing 23 and is the direction of a clockwise rotation) It does not work as the moment of the direction to which said frictional resistance force F_2 floats the development cartridge 4 against the self-weight (load W_o of a center of gravity G) of the development cartridge 4 at the time of image formation actuation, and the action of the development cartridge 4 is stabilized.

[0058] And since **** from which the direction of the rotation driving force given from said gear device 74 over developing-roller shaft 22a of a developing roller 22 also turns into the direction of a clockwise rotation in drawing 23 , and this angular moment (running torque) also serve as said frictional resistance force F_2 and the same direction as the angular moment by the self-weight of the development cartridge 4, the action of the development cartridge 4 is stabilized by them.

[0059] Moreover, since said frictional resistance force F_2 has only the component as the angular moment to developing-roller shaft 22a which is the center of rotation, even if it changes the frictional resistance force F_2 , the development actuation by which did not change the thrust to the photo conductor drum 13 of a developing roller 22, and it was stabilized is possible for it.

[0060] In the above-mentioned configuration, it is the stowage 32 in the photo conductor cartridge 3, and since it protruded on the outer wall of the developer (toner) hold room 24 of the same side far from a developing roller 22 outward and the acted section 61 was formed while forming the energization means 42 in the part distant from the developing roller 22 which inserts the development cartridge 4, these components cannot change easily obstructive on the occasion of the attachment-and-detachment activity of the development cartridge 4.

[0061] While forming the complicated energization means 42 of structure in few [exchange frequency] photo conductor cartridge 3 side, by forming the easy acted section 61 of structure in the high development cartridge 4 side of exchange frequency, the manufacturing cost of the development cartridge 4 can be reduced and a running cost can be reduced. Moreover, since the acted section 61 prepared in the development cartridge 4 is structure which projects on the side of a case 21 in one, and is formed in it, while formation of the acted section 61 is made to shaping of a case 21 and coincidence and being able to reduce a manufacturing cost, it becomes that it is easy to make it act so that it may press by the slide supporter material 40 of the energization means 42 formed in the photo conductor cartridge 3 side.

[0062] To the inside of the right-and-left both sides of the photo conductor cartridge 3, the energization means 42 of a left Uichi pair is arranged. Since it is equipped with this each energization means 42 possible [posture modification in the energization direction and the non-energizing direction], only by putting the development cartridge 4 on the photo conductor cartridge 3 Since a developing roller 22 is not pressed by the photo conductor drum 13, even if it carries out condition *****, the peripheral face of a developing roller 22 does not carry out permanent deformation, or the photo conductor drum 13 is not polluted by the component which incorporated both the cartridges 3 and 4 as a process unit 2 and which a developing roller 22 contains.

[0063] The energization means 42 receives the rotation supporting-point member 39 and this rotation supporting-point member 39. The slide supporter material 40 which can slide freely, Since it is constituted by the energization spring 41 constructed across among these both members The effect that it can perform certainly pressing the acted section 61 directly with the energization spring 41, or the flexibility made to make a posture change in the energization direction and the non-energizing direction becoming large compared with canceling it, and carrying out press / press discharge of the acted section 61 by the slide supporter material 40 is done so. [0064] furthermore -- since said rotation supporting-

point member 39 is that with which the right-and-left both-sides medial surface of the case 30 which is the case of the photo conductor cartridge 3 is equipped rotatable -- photo conductor cartridge 3 simple substance -- be -- the condition of the process unit 2 combined with the development cartridge 4 -- be -- it does not expose, and accidentally, the components of most energization means 42 touch the components of the energization means 42, and do not damage the outside of a case 30, and handling becomes easy.

[0065] Said slide supporter material 40 is equipped with the migration operation section 43 of the shape of a sideways pin for guiding in the energization direction and the non-energizing direction in one. Since it has projected outward from the guide hole 44 of the right-and-left both sides of the case 30 where this migration operation section 43 is the case of the photo conductor cartridge 3 It does not expose, and accidentally, the components of most energization means 42 touch the components of the energization means 42, and do not damage the outside of a case 30, and handling becomes easy.

[0066] Moreover, since it becomes the common components which combine the function by which press energization is carried out, and the function of which it is made for the development cartridge 4 not to slip out upwards to the photo conductor cartridge 3 with the locking lever object 47 of the lock means 46 for the energization means 42, the acted section 6 projected on the right-and-left both-sides external surface of the case 21 of the development cartridge 4 can be made to reduce the manufacturing cost of the development cartridge 4 sharply.

[0067] It constitutes so that it may be equipped with a process unit 2 free [attachment and detachment] to the main part housing 1 of image formation equipment. In this main part housing 1 Since it has the guide means 55 for showing said energization means 42 to an energization condition and the condition of not energizing along with migration to the path of insertion of a process unit 2 Posture modification of the energization means 42, as a result an operation of the energization means 42 can be made to switch and change by one-touch only by the activity of only detached and attaching a process unit 2 to the main part housing 1, and the effect that actuation becomes very easy is done so.

[0068]

[Effect of the Invention] The energization means for energizing a developing roller to said photo conductor, while the process unit of invention according to claim 1 is equipped with the photo conductor cartridge which has the photo conductor with which an electrostatic latent image is formed, and the development cartridge which has a developing roller for supplying a developer to a photo conductor and said development cartridge is constituted free [attachment and detachment] to a photo conductor cartridge as explained in full detail above forms in a photo conductor cartridge, and the acted section on which said energization means acts prepares in said development cartridge side.

[0069] Thus, while forming the complicated energization means of structure in few [exchange frequency] photo conductor cartridge side, the effect that the manufacturing cost of a development cartridge can be reduced and a running cost can be reduced by preparing the easy acted section of structure in the high development cartridge side of exchange frequency is done so.

[0070] Moreover, in a process unit according to claim 1, since invention according to claim 2 is constituted so that the closest-approach location of a photo conductor and a developing roller may be located in the extension top of the line of action of the energization force of a developing roller over the photo conductor by said energization means, or the line-of-action bottom, a development cartridge does not become with some relief and it does so the effect that an action is stabilized.

[0071] And since invention according to claim 3 is equipped with the lock means for maintaining the condition equipped with said development cartridge to the photo conductor cartridge, if a development cartridge is locked by this lock means, a development cartridge does not separate carelessly from a photo conductor cartridge, or a location does not shift, and it will do so the effect that exchange of a development cartridge becomes easy, in a process unit according to claim 1 or 2.

[0072] In the process unit according to claim 3, said lock means is formed in the acted section prepared in said development cartridge side, and said photo conductor cartridge side, and invention according to claim 4 is alternatively constituted from a locking lever object in which posture modification is possible by the operation location and the non-acting location to said acted section.

[0073] Therefore, it is the acted section with an easy configuration for the high development cartridge of exchange frequency, and since this acted section can make serve a double purpose further for [for an energization means] a lock means by preparing the complicated locking lever object of structure in a photo conductor cartridge with low exchange frequency, the effect that the manufacturing cost of the development cartridge of a disposable mold can reduce does so.

[0074] The photo conductor cartridge of invention according to claim 5 is equipped with the photo conductor with which an electrostatic latent image is formed, a case with the development cartridge removable while supporting the photo conductor which has a developing roller for supplying a developer to the photo conductor concerned, and the

energization means for energizing the developing roller of said development cartridge with which the case was formed and equipped to a photo conductor.

[0075] Therefore, since a development cartridge can be detached, attached and exchanged to a photo conductor cartridge, the development cartridge fitted in in the case in a photo conductor cartridge and the press means was formed in the photo conductor cartridge side with low exchange frequency while being able to deal with both cartridges as one, the effect that the manufacturing cost of the high development cartridge of exchange frequency can be reduced is done so.

[0076] The photo conductor cartridge of invention according to claim 6 In the inside of the right-and-left both sides of said photo conductor cartridge The energization means of a left Uichi pair is arranged. This each energization means Since it is equipped in the energization direction and the non-energizing direction possible [posture modification] to the acted section prepared in said development cartridge, even if the length of the longitudinal direction of a photo conductor cartridge is long The right-and-left both sides of a development cartridge which fit into it can be energized to abbreviation homogeneity simultaneous, and an energization operation of the developing roller to a photo conductor also becomes homogeneity. Only by posture modification of an energization means The effect that it can perform certainly making a posture change make in the energization direction and the non-energizing direction, and carrying out energization / energization discharge is done so.

[0077] Invention according to claim 7 is set to a photo conductor cartridge according to claim 6. An energization means As opposed to a rotation supporting-point member and this rotation supporting-point member The slide supporter material which can slide freely, Since it is constituted by the energization spring means constructed across among these both members The effect that it can perform certainly energizing the acted section directly with an energization spring means, or the flexibility made to make a posture change in the energization direction and the non-energizing direction becoming large compared with canceling it, and carrying out energization / energization discharge of the acted section in slide supporter material is done so.

[0078] furthermore -- since invention according to claim 8 is that by which the right-and-left both-sides medial surface of the case in said photo conductor cartridge is equipped with said rotation supporting-point member rotatable in a photo conductor cartridge according to claim 7 -- the simple substance of a photo conductor cartridge -- be -- the condition of the process unit combined with the development cartridge -- be -- it does not expose, and accidentally, a rotation supporting-point member touches components, and does not damage a cartridge outside, and handling becomes easy.

[0079] Invention according to claim 9 is set to a photo conductor cartridge according to claim 7 or 5. To said slide supporter material It has the migration operation section for guiding in the energization direction and the non-energizing direction in one. Since it has projected outward from the right-and-left both sides of the case of a photo conductor cartridge, it does not expose, and accidentally, the components of most energization means touch the components of an energization means, and do not damage the outside of a cartridge, and handling becomes easy.

[0080] Invention according to claim 10 is set to a photo conductor cartridge according to claim 5 to 9. To said case Since it has a lock means for maintaining the condition of having equipped with said development cartridge, if a twist is locked by said lock means where a development cartridge is set to a case The development cartridge concerned does not separate carelessly from a photo conductor cartridge, or a location does not shift, and the effect that exchange of a development cartridge becomes easy is done so.

[0081] In a photo conductor cartridge according to claim 10, said lock means is formed in the at least 1 side inside of the case of said photo conductor cartridge, and invention according to claim 11 has alternatively the locking lever object in which posture modification is possible in an operation location and a non-acting location to said acted section of said development cartridge.

[0082] Thus, while being able to set a development cartridge beforehand to the photo conductor cartridge in the condition of having taken out from image formation equipment by constituting, when carrying this set thing, it can prevent that a development cartridge slips out from a photo conductor cartridge carelessly, or the set location shifts. And since the acted section made it serve a double purpose as a thing to an energization means and a lock means, structure becomes easy and the effect that a manufacturing cost can also be reduced is done so.

[0083] The development cartridge of invention according to claim 12 is prepared in a removable case and its case to the photo conductor cartridge which has said photo conductor, and in order to energize said developing roller to said photo conductor, it is equipped with the acted section on which the energization means formed in said photo conductor cartridge acts while it supports the developing roller and developing roller for supplying a developer to a photo conductor.

[0084] Thus, by preparing the acted section in the case of a development cartridge, the acted section can also be formed in coincidence at the time of formation of a case, and the effect that a manufacturing cost can be reduced is done so.

[0085] The development cartridge of invention according to claim 13 It has the processing laboratory which has a developing roller, and the developer hold room which stores a developer. Since the acted section protrudes on the outer wall of a developer hold room outward, while formation of the acted section is made to shaping and coincidence of a development cartridge and being able to reduce a manufacturing cost The effect of becoming it being easy to make it acting so that it may press in the slide supporter material of the energization means formed in the photo conductor cartridge side is done so.

[0086] Moreover, in a development cartridge according to claim 12 or 13, to the case of said development cartridge, since invention according to claim 14 has the acted section to the lock means for maintaining the condition of having equipped with the development cartridge concerned, it can also form the acted section in coincidence at the time of formation of a case, and does so the effect that a manufacturing cost can be reduced.

[0087] Furthermore, in a development cartridge according to claim 14, since invention according to claim 15 makes the acted section to said lock means, and the acted section to an energization means make it serve a double purpose, the structure of the acted section becomes easy and it does so the effect that a manufacturing cost can also be reduced.

[0088] Invention according to claim 16 is set to image formation equipment according to claim 1 to 15. It constitutes so that it may be equipped with a process unit free [attachment and detachment] to the main part of equipment. It takes to migration to the path of insertion of the process unit to this main part of equipment. Since it has a guide means for showing said energization means to an energization condition and the condition of not energizing Posture modification of an energization means, as a result an operation of an energization means can be made to switch and change by one-touch only by the activity of only detached and attaching a process unit to the main part of equipment, and the effect that actuation becomes very easy is done so.

[0089] Furthermore, the migration operation section in said photo conductor cartridge has projected invention according to claim 17 sideways possible [a slide contact] to said guide means, and it does so the effect that flexibility is made to the attachment-and-detachment activity of a process unit, and handling can be simply done since there is little constraint over the guide means of the migration operation section, in image-formation equipment according to claim 1 to 16.

[Translation done.]

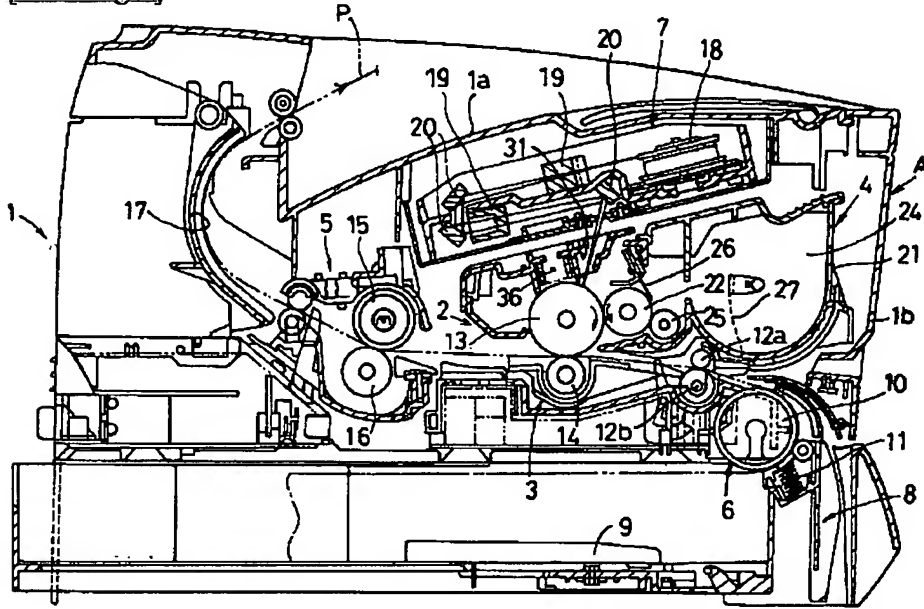
* NOTICES *

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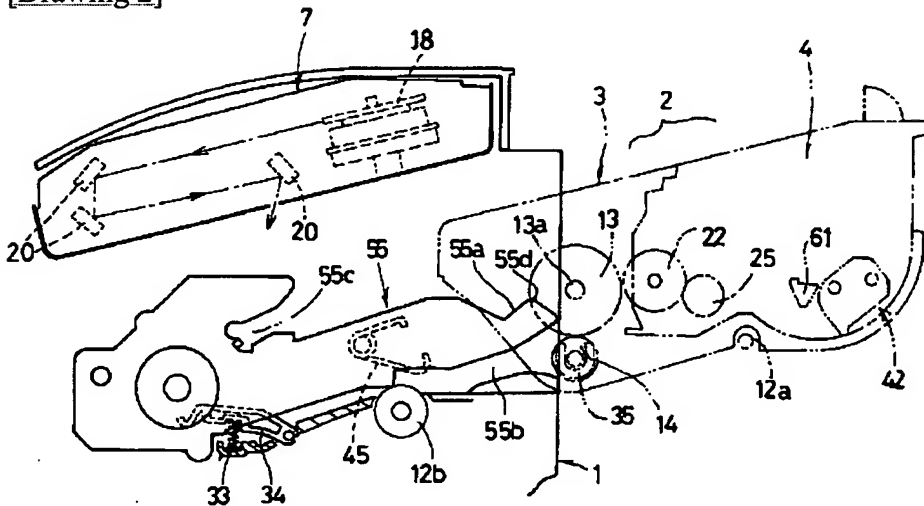
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

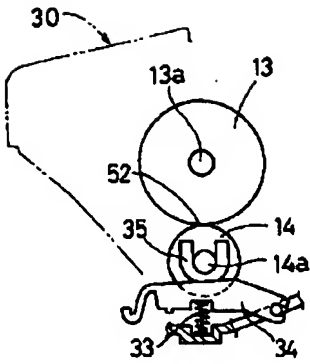
[Drawing 1]



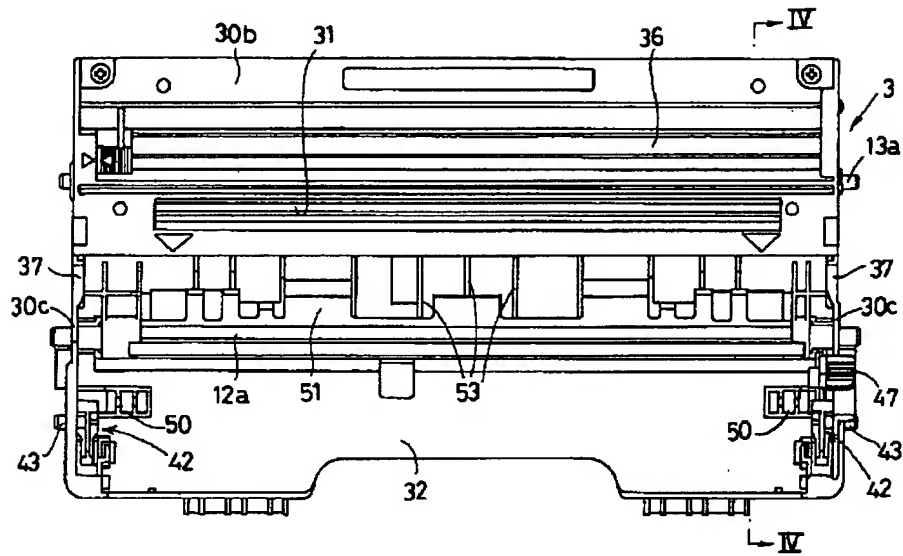
[Drawing 2]



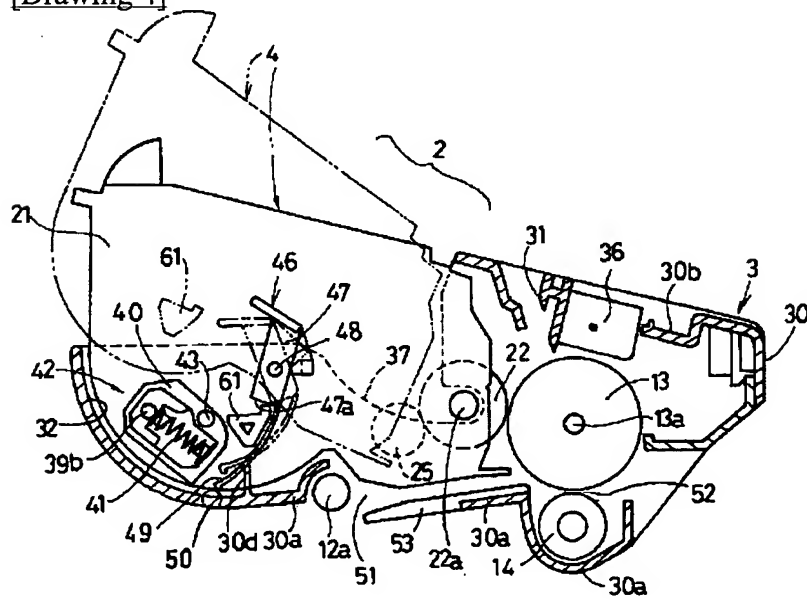
[Drawing 9]



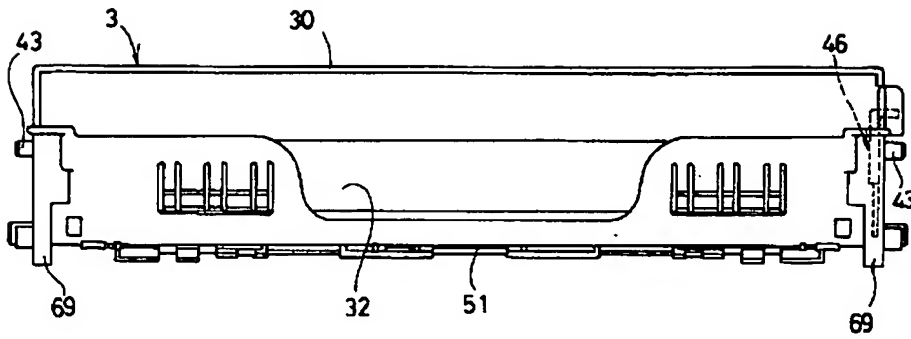
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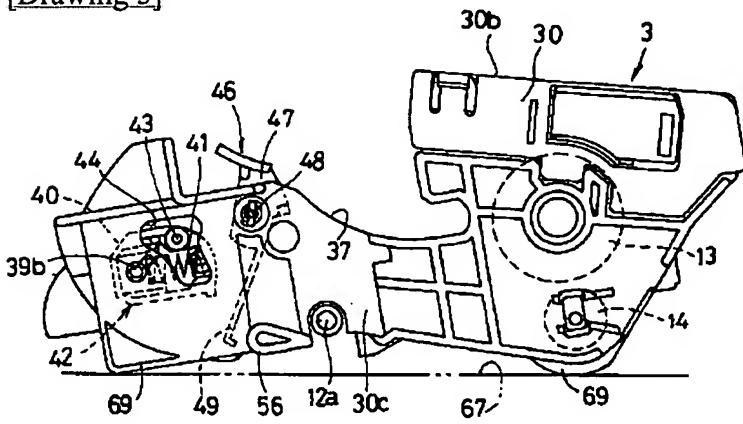
[Drawing 4]



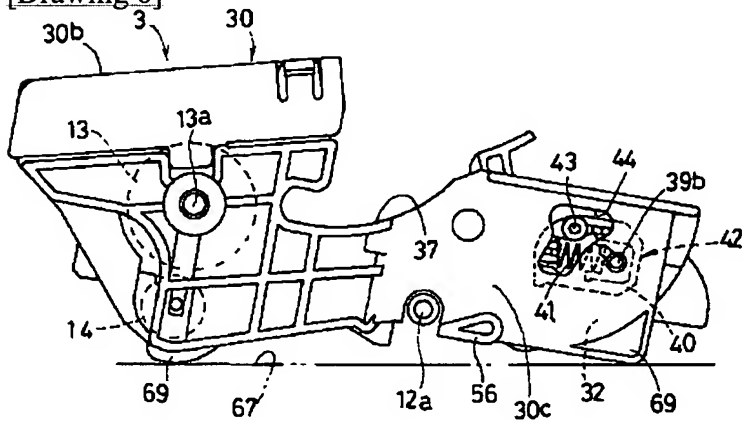
[Drawing 7]



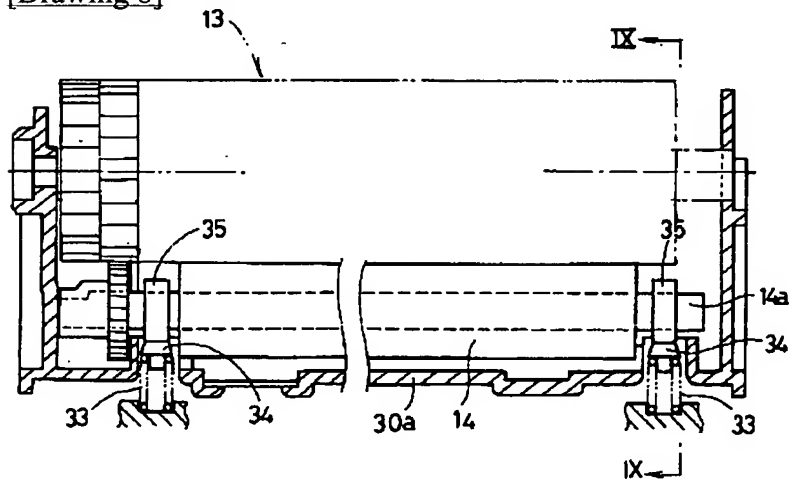
[Drawing 5]



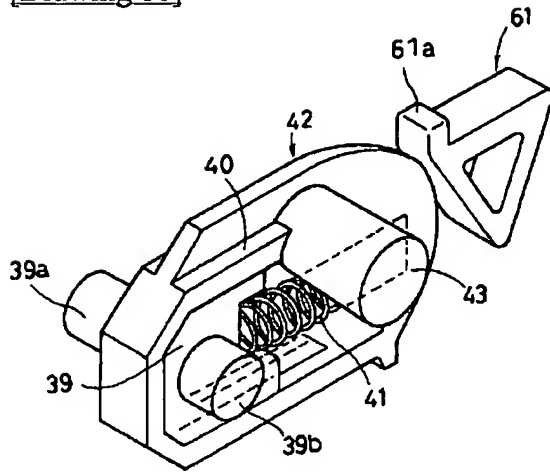
[Drawing 6]



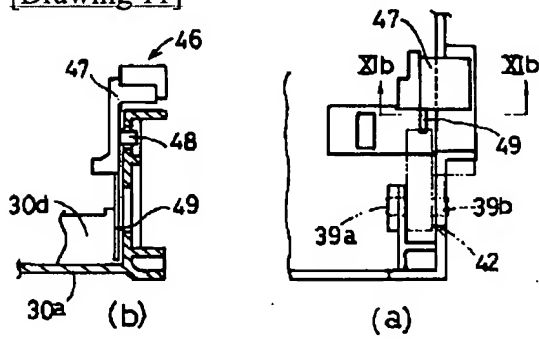
[Drawing 8]



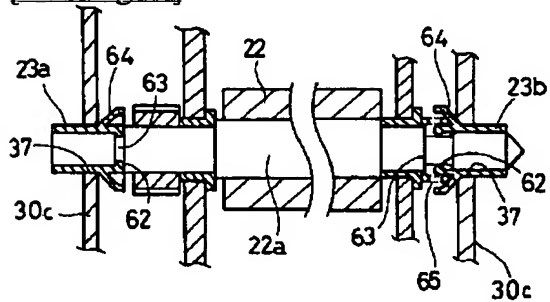
[Drawing 10]



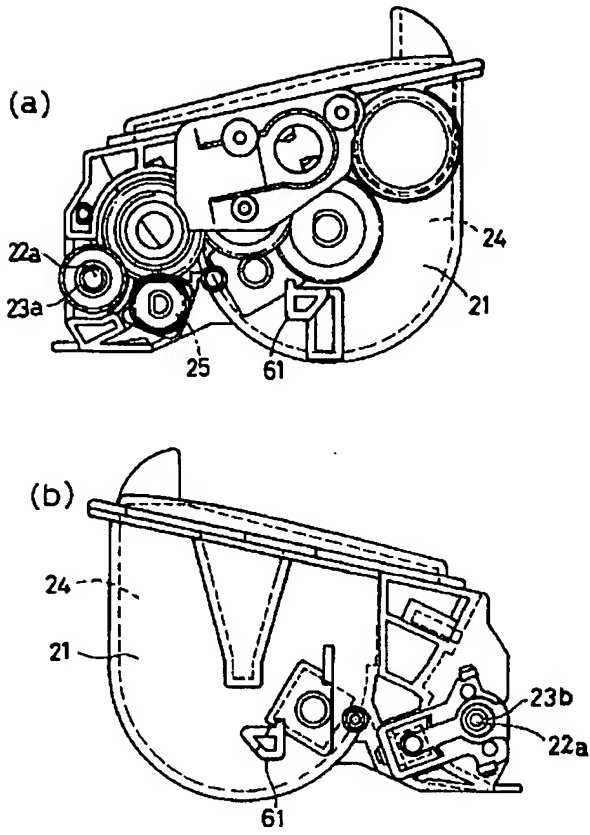
[Drawing 11]



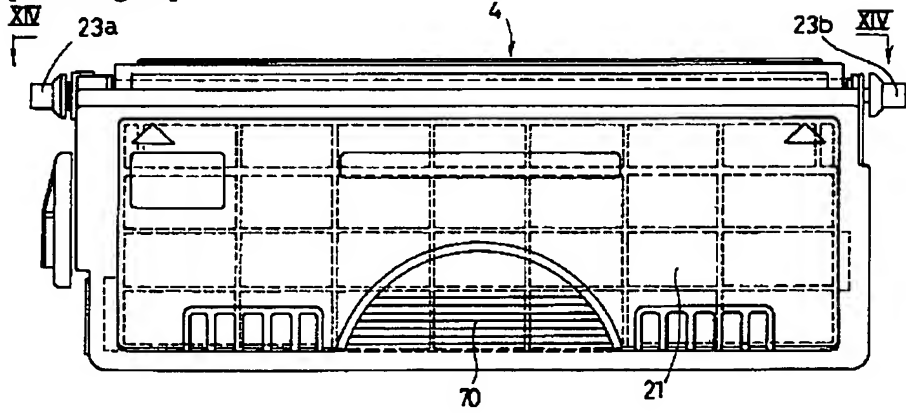
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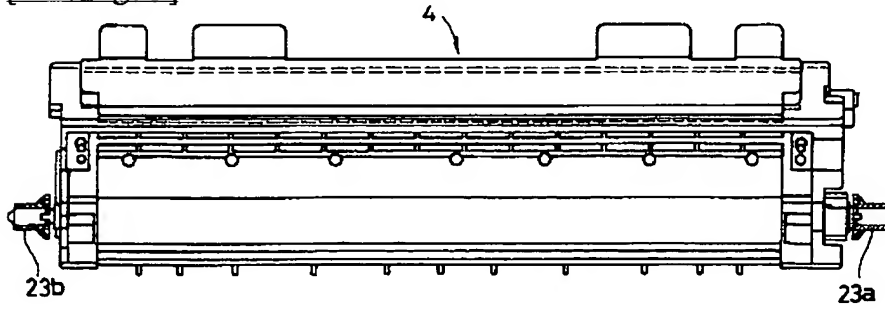
[Drawing 12]



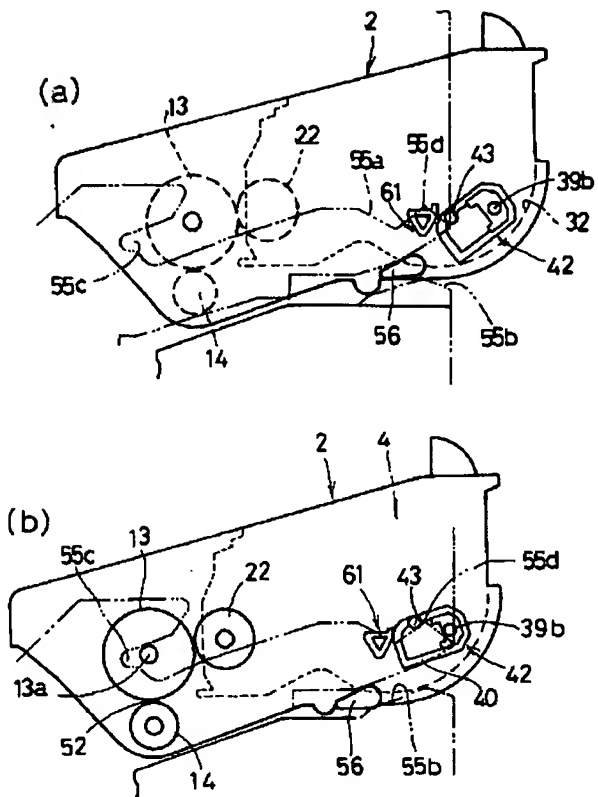
[Drawing 13]



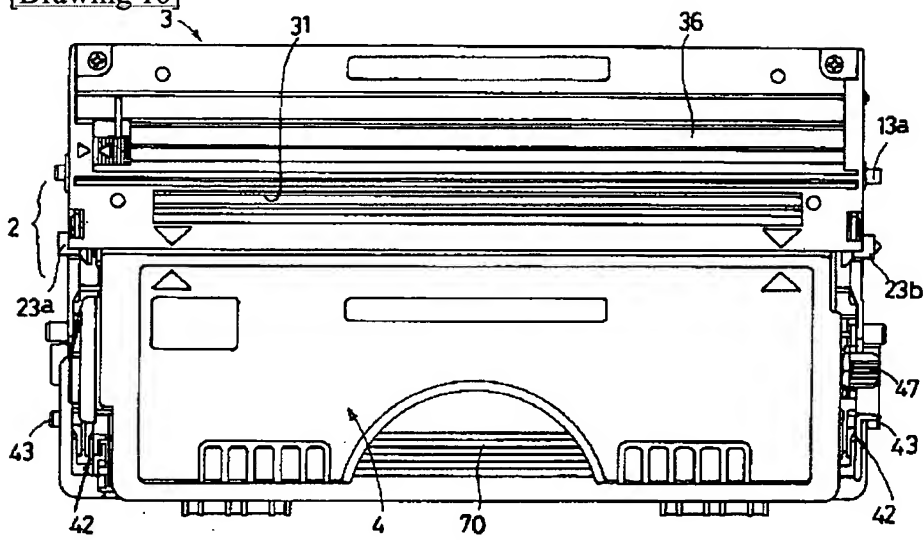
[Drawing 14]



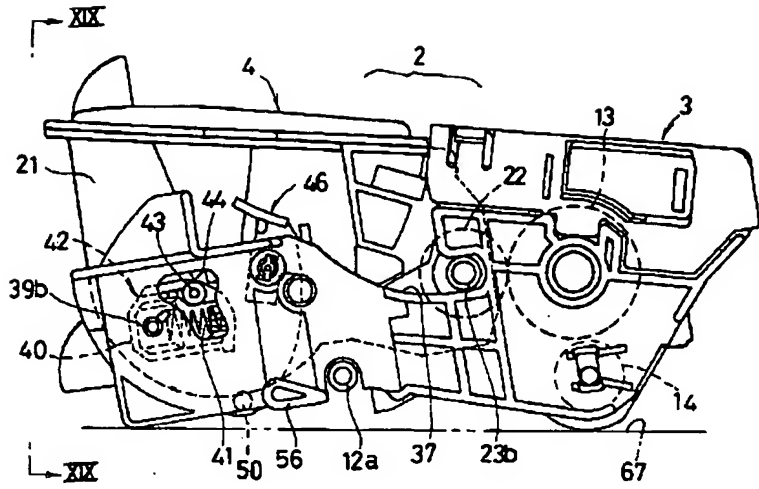
[Drawing 20]



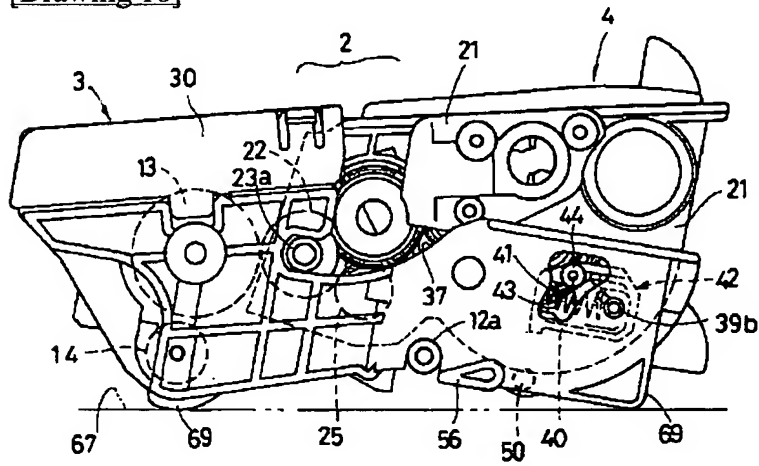
[Drawing 16]



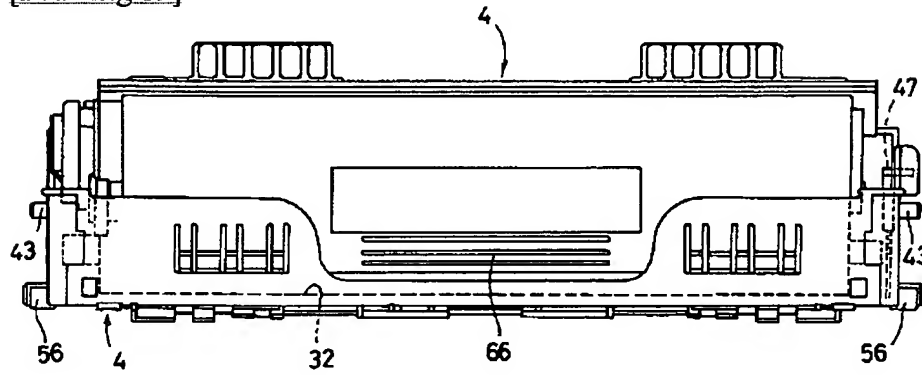
[Drawing 17]



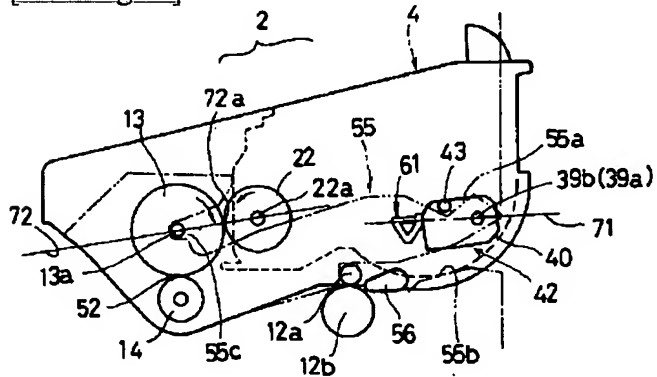
[Drawing 18]



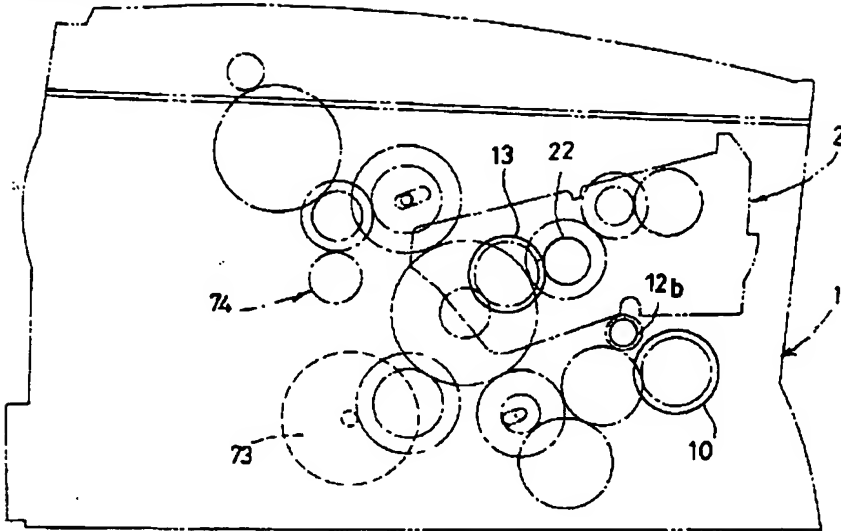
[Drawing 19]



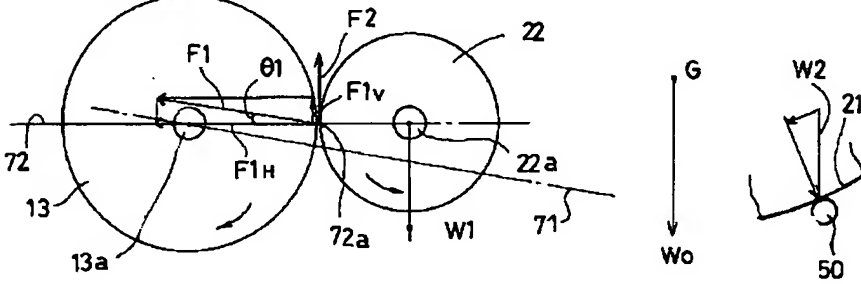
[Drawing 21]



[Drawing 22]



[Drawing 23]



[Translation done.]